

CLAIMS

1. A method for regulating a temperature of a bottle mold, comprising allowing vertical ventilation to be carried out in a plurality of circumferential locations around a contour surface (1a, 2a, 3a) of a mold (1, 2, 3) in a process of molding, and

wherein the ventilation is carried out for cooling using an abutting path (1d, 2d, 3d) formed by abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) forming a contour surface part and an outer peripheral part of the mold (1, 2, 3), so that the temperature of the mold (1, 2, 3) is regulated.

2. A method for regulating a temperature of a bottle mold, comprising allowing vertical ventilation to be carried out in a plurality of circumferential locations around a contour surface (1a, 2a, 3a) of a mold (1, 2, 3) in a process of molding, and

wherein the ventilation is carried out for cooling using a connection between an abutting path (1d, 2d, 3d) formed by abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) forming a contour surface part and an outer peripheral part of the mold (1, 2, 3) and a through path (13, 14, 15) having one or more straight path section (10) formed in the inner member (1b, 2b, 3b) or/and the outer member (1c, 2c, 3c), so that the temperature of the mold (1, 2, 3) is regulated.

3. A method for regulating a temperature of a bottle mold, comprising allowing vertical ventilation to be carried out in a

plurality of circumferential locations around a contour surface (1a, 2a, 3a) of a mold (1, 2, 3) in a process of molding, and

wherein the ventilation is carried out for cooling in a path that substantially conforms to a non-straight shape in an axial direction of the contour surface (1a, 2a, 3a) using a connection between an abutting path (1d, 2d, 3d) formed by abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) forming the contour surface part and an outer peripheral part of the mold (1, 2, 3) and a through path (13, 14, 15) having two or more straight path sections (10) formed in the inner member (1b, 2b, 3b) or/and the outer member (1c, 2c, 3c), so that the temperature of the mold (1, 2, 3) is regulated.

4. The method for regulating a temperature of a bottle mold according to any one of claims 1 to 3, wherein the abutting path (1d, 2d, 3d) bent in the axial direction is used.

5. The method for regulating a temperature of a bottle mold according to any one of claims 1 to 3, wherein thermal insulation is enabled by a hollow part (21) formed between the abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1), and the temperature of the mold (1, 2, 3) is regulated in combination with the cooling.

6. The method for regulating a temperature of a bottle mold according to any one of claims 1 to 3, wherein the temperature of the mold (1, 2, 3) is regulated based on a difference in thermal conductivity from the inner member (1b, 2b, 3b) to the outer member (1c, 2c, 3c) depending on a combination of materials selected for the inner member

(1b, 2b, 3b) and the outer member (1c, 2c, 3c).

7. The method for regulating a temperature of a bottle mold according to any one of claims 1 to 3, wherein the inner member (1b, 2b, 3b) and the outer member (1c, 2c, 3c) are detachably combined in use, the temperature of the mold (1, 2, 3) is regulated based on a difference in thermal conductivity from the inner member (1b, 2b, 3b) to the outer member (1c, 2c, 3c) between when the inner member (1b, 2b, 3b) is supported as the inner member (1b, 2b, 3b) is fixed to the outer member (1c, 2c, 3c) by a bolt (31) and when the inner member (1b, 2b, 3b) is supported as the inner member (1b, 2b, 3b) is fitted to the outer member (1c, 2c, 3c) from above.

8. The method for regulating a temperature of a bottle mold according to any one of claims 1 to 3, wherein ventilation is also carried out from the abutting path (1d, 2d, 3d) to a cooling path (52) for a lip mold (51) held between the inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) of the mold (1, 2, 3) to be in communication with the contour surface (1a, 2a, 3a) of the mold (1, 2, 3), so that the temperature is regulated.

9. A bottle mold comprising inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) formed by casting, for forming a contour surface part and an outer peripheral part of the mold (1, 2, 3),

and further comprising a cooling path (16, 17, 18) that includes an abutting path (1d, 2d, 3d) formed between abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of the inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) by casting,

wherein the cooling path (16, 17, 18) has a vent (11) and an exhaust outlet (12) at an outer peripheral surface of the mold (1, 2, 3).

10. A bottle mold comprising inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) formed by casting and forming a contour surface part
5 and an outer peripheral part of the mold (1, 2, 3),

and further comprising a cooling path (16, 17, 18) that includes an abutting path (1d, 2d, 3d) formed between abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of the inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) by casting, and a through path (13, 14, 15) one or more
10 straight path section (10) formed in the inner member or/and the outer member in communication with the abutting path,

wherein the cooling path (16, 17, 18) has a vent (11) and an exhaust outlet (12) at an outer peripheral surface of the mold (1, 2, 3).

11. A bottle mold comprising inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) formed by casting and forming a contour surface part
15 and an outer peripheral part of the mold (1, 2, 3),

and further comprising a cooling path (16, 17, 18) that includes an abutting path (1d, 2d, 3d) formed between abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of the inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) formed by casting, and a through path (13, 14, 15) having
20 two or more straight path sections (10) formed in the inner member (1b, 2b, 3b) or/and the outer member (1c, 2c, 3c) to be in communication with the abutting path, the cooling path (16, 17, 18) substantially conforming to a non-straight shape of the contour surface (1a, 2a, 3a)
25 in the axial direction,

wherein the cooling path (16, 17, 18) has a vent (11) and an exhaust outlet (12) at an outer peripheral part of the mold (1, 2, 3).

12. A bottle mold comprising inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) formed by casting and forming a contour surface part
5 and an outer peripheral part of the mold (1, 2, 3),

and further comprising a cooling path (16, 17, 18) that includes an abutting path (1d, 2d, 3d) formed between abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of the inner member (1b, 2b, 3b) made of a Ni-based alloy and the outer member (1c, 2c, 3c) by casting, and a
10 through path (13, 14, 15) formed in the inner member (1b, 2b, 3b) or/and the outer member (1c, 2c, 3c) in communication with the abutting path,

wherein the cooling path (16, 17, 18) has a vent (11) and an exhaust outlet (12) at an outer peripheral surface of the mold.

13. A bottle mold comprising inner and outer members formed by
15 casting and forming a contour surface part and an outer peripheral part of the mold (1, 2, 3),

and further comprising a cooling path (16, 17, 18) that includes an abutting path (1d, 2d, 3d) formed by casting between abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) of the inner member (1b, 2b, 3b) made of a Ni-based alloy and the outer member (1c, 2c, 3c) made
20 of any one of cast iron, stainless steel, and a copper alloy, and a through path (13, 14, 15) formed in the inner member (1b, 2b, 3b) or/and the outer member (1c, 2c, 3c) in communication with the abutting path,

wherein the cooling path (16, 17, 18) has a vent (11) and an exhaust
25 outlet (12) at an outer peripheral surface of the mold (1, 2, 3).

14. The bottle mold according to claim 12 or 13, wherein the Ni-based alloy contains silicon, boron, or both of silicon and boron as an active ingredient.

15. The bottle mold according to any one of claims 9 to 13, wherein the contour surface (1a, 2a, 3a) has a surface thereof made into a rough surface having any one of a micro crack form, a porous form, and an irregular form.

16. The bottle mold according to any one of claims 9 to 13, wherein the contour surface (1a, 2a, 3a) has a surface thereof roughened, and a surface roughness Ra thereof is in a range of from 1.0 μ m to 8.0 μ m.

17. The bottle mold according to any one of claims 9 to 11, wherein the inner member (1b, 2b, 3b) is made of any one of cast iron, stainless steel, and a copper alloy, and a surface thereof contains any one of chromium carbide and chromium nitride as a main component.

18. The bottle mold according to any one of claims 9 to 13, wherein a hollow part (21) is formed between the abutting surfaces (1b1, 1c1) (2b1, 2c1) (3b1, 3c1) by casting.

19. The bottle mold according to any one of claims 9 to 13, wherein the inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) are detachably combined, so that the outer member (1c, 2c, 3c) is radially fixed with a bolt (31) from the outer circumferential surface of the outer member at the circumferential center thereof.

20. The bottle mold according to any one of claims 9 to 13, wherein the inner member (1b, 2b, 3b) is supported so that the inner member is detached/attached from/to the outer member (1c, 2c, 3c) from above.

21. The bottle mold according to any one of claims 9 to 13, wherein the inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) have fitting portions (41, 42) that fit the inner member (1b, 2b, 3b) to the outer member (1c, 2c, 3c) from above for support, and a through hole (32) and a screw hole (33) through which a bolt (31) is radially fastened to the inner member (1b, 2b, 3b) from the outer circumferential surface of the outer member (1c, 2c, 3c) at the circumferential center thereof.

22. The bottle mold according to any one of claims 9 to 13, further comprising a lip mold (51) held between the inner and outer members (1b, 1c) (2b, 2c) (3b, 3c) of the mold (1, 2, 3) and provided in communication with the contour surface (1a, 2a, 3a)- of the mold (1, 2, 3), the lip mold (51) having a cooling path (52) in communication with the abutting path (1d, 2d, 3d).